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EXAMINER	
NATNAEL, PAULOS M	

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2614	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/701,514	HOLLIER, MICHAEL P	
	Examiner	Art Unit	
	Paulos M. Natnael	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims **1-10** are again rejected under 35 U.S.C. 103(a) as being unpatentable over Wolf et al., U.S. Pat. No. 5,596,364.

Considering claim **1**, Wolf et al disclose the following claimed subject matter, note;

a) measuring the actual synchronization errors between the audio and visual elements of the stimulus is met by audio-visual synchronization processor 160, Fig.6, which outputs audio-visual sync value S_av. (col. 12, lines 60-64)

c) generating a measure of subjective quality from said synchronisation errors and characteristics is met by the disclosure "Subjective human test panel results are generated for a variety of audio-video test samples and objective test results are also generated by the apparatus.." (See Abstract).

d) analyzing the audio and visual elements of the stimulus for the presence of characteristic features indicative of the significance of synchronization errors, is met by the disclosure "the audio-visual synchronization unit 160 in FIG. 7 uses the video delay 15 d.sub.v as output by the video alignment processor 50 and the audio delay 115 d.sub.a as output by the audio alignment processor 150 and produces the audio-visual synchronization 165 s.sub.av. Advantageously, the audio-visual synchronization s.sub.av provides a measure of the perceptual change in audio-visual synchronization from a source of audio-visual information to a destination of audio-visual information via a transmission channel." (col. 14, lines 4-12)

e) modifying the measure of subjective quality derived from the synchronisation errors and characteristics according to whether said characteristic feature are present, is met by the disclosure that "Subjective tests are normally performed by having a large panel of viewers judge the perceived video quality. However, these subjective tests are very expensive and time consuming to conduct." (col. 3, lines 32-36) "Subjective testing 39 is conducted using the source video 1, the impaired destination video 5', and a large panel of viewers to judge the impairment of the impaired destination video 5' with respect to the source video 1. The subjective testing 39 produces the viewing panel results 40. (col. 6, lines 52-56)

Except for;

b) identifying characteristics of audio and visual cues in the stimulus;

Regarding b) Wolf et al. discloses a perception-based audio visual synchronization measurement system wherein "Subjective human test panel results are generated for a variety of audio-video test samples and objective test results are also generated by the apparatus and measurement of audio visual synchronization are conducted." (see Abstract) The audio-visual synchronization processor 160, Fig.6, measures the synchronization S_av 165 by measuring the audio and video delays.

Therefore, it would have been obvious to the skilled in the art at the time the invention was made to modify the system of Wolf et al by identifying the characteristics of the audio and visual cues, because analysis and measurement of the audio-visual synchronization would not be done without initially identifying the characteristics of the audio and visual cues.

Considering claim 2, the claimed wherein the characteristics of the audio and visual cues are used to generate one or more synchronization error tolerance values.

Regarding claim 2, see rejection of claim 1 (a).

Considering claim 3, a method as claimed in claim 2, wherein the audio-visual stimulus is monitored for occurrences of synchronization errors exceeding such tolerance values, is met by the disclosure that "Preferably, the time alignment processor 34 only computes the video delay (d.sub.v) when motion is present in the source video. When there is no motion in the source video, the video delay need not be measured. The standard deviation of the x.sub.2 (t.sub.N) time series is used to determine the amount

of motion in the source video, and hence serves as a useful method for determining the threshold below which there is no motion." (see col. 9, lines 46-53; see also rejection of claim 1(a)).

Considering claim 4, a method according to claim 3, wherein the means generating the stimulus is controlled to maintain the synchronization in a predetermined relationship with the said tolerance values.

Regarding claim 4, see rejection of claim 3.

Considering claim 5, wherein the resulting measure of subjective quality is used to control the operation of an avatar animation process;

Regarding claim 5, Wolf et al. discloses, "The video portion of the invention may be used to measure the video quality and video delay of transmission channels. The video may include moving images as well as still images." (col. 1, lines 16-19) Wolf et al. does not specifically disclose whether or not the result of the measurement of subjective quality is to control the operation of an avatar animation process. However, Examiner takes Official Notice in that it is well known in the art that an avatar or character animation processing requires the synchronization of the audio/voice of the character with the character's movements.

Therefore, it would have been obvious to the skilled in the art at the time the invention was made to modify the system of Wolf et al. by providing an avatar or

character animation processing capability in order to be able to control more systems and enhance the usefulness of the system.

Considering claim 6, apparatus for determining the subjective quality of an audio-visual stimulus, comprising:

a) means for measuring the actual synchronization errors between the audio and visual elements of the stimulus, is met by audio-visual synchronization processor 160, Fig.6. (col. 12, lines 60-64)

c) means for generating a measure of subjective quality from said synchronization errors and characteristics, is met by the disclosure "Subjective human test panel results are generated for a variety of audio-video test samples and objective test results are also generated by the apparatus.." (See Abstract).

d) means for analyzing the audio and visual elements of the stimulus for the presence of characteristic features indicative of the significance of synchronization errors, is met by the disclosure "the audio-visual synchronization unit 160 in FIG. 7 uses the video delay 15 d.sub.v as output by the video alignment processor 50 and the audio delay 115 d.sub.a as output by the audio alignment processor 150 and produces the audio-visual synchronization 165 s.sub.av. Advantageously, the audio-visual

synchronization s.sub.av provides a measure of the perceptual change in audio-visual synchronization from a source of audio-visual information to a destination of audio-visual information via a transmission channel." (col. 14, lines 4-12)

e) means for modifying the measure of subjective quality derived from the synchronisation errors and characteristics according to whether said characteristic feature are present, is met by the disclosure that "Designers of video transmission equipment and standards organizations have resorted to using subjective tests when they require accurate measurements of video quality... Subjective tests are normally performed by having a large panel of viewers judge the perceived video quality. However, these subjective tests are very expensive and time consuming to conduct." And, "Subjective testing 39 is conducted using the source video 1, the impaired destination video 5', and a large panel of viewers to judge the impairment of the impaired destination video 5' with respect to the source video 1. The subjective testing 39 produces the viewing panel results 40. (col. 1, lines 30-32 and col. 3, lines 32-36, col. 6, lines 52-56, respectively)

Except for;

b) means for the identifying characteristics of audio and visual elements of the stimulus;

Regarding b), see rejection of claim 1(b).

Considering claim **7**, apparatus according to claim 6, wherein the means for identifying cue characteristics generates one or more synchronization error tolerance values.

Regarding claim 7, see rejection of claim 3;

Considering claim 8, apparatus as claimed in claim 7, comprising means for monitoring the audio-visual stimulus for occurrences of synchronization errors exceeding said tolerance values.

Regarding claim 8, see rejection of claim 3;

Considering claim 9, apparatus according to claim 8, comprising means for controlling the means generating the stimulus to maintain the synchronization in a predetermined relationship with the said tolerance values;

Regarding claim 9, see rejection of claim 4.

Considering claim **10**, the apparatus according to claim 9, further comprising animation process means controlled by the subjective quality measurement means to generate an animated image;

Regarding claim 10, see rejection of claim 5.

Response to Arguments

3. Applicant's arguments filed March 22, 2004 have been fully considered but they are not persuasive. Following is a response.

Applicant's Arguments

a) Wolf et al. discloses a system for extracting features from reference and degraded signals, and measuring the delay between these features to compute the synchronization error between the audio and video. Wolf does so by measuring the differences in delay between the audio and the video signal. Wolf et al does not teach or suggest analyzing the audio and visual elements of the stimulus for the presence of characteristic features indicative of the significance of synchronization error" and ***"modifying the measure of subjective quality derived from the synchronisation errors and characteristics according to whether said characteristic feature are present",*** as now more clearly recited in the present claimed.

b)...no where does Wolf et al. teach or suggest that the "audio-visual parameters" are used to modify the measure of subjective quality derived from the "audio-visual parameters" according to whether the "audio-visual parameters" are present, as required in invention.

Examiner's Response

a) Wolf et al. disclose a perception-based audio visual synchronization measurement system that extracts test frame from the actual source and destination audio-video signals and compares them, audio-visual quality parameters are output by the apparatus that are indicative of the audio visual quality of the destination audio-visual

signal based upon the source audio-visual signal. Further, Wolf et al. disclose that subjective human test panel results are generated for a variety of audio-video test samples and objective test results are also generated by the apparatus. (See Abstract). Furthermore, the Wolf et al references specifically teaches that "the audio-visual synchronization unit 160 in FIG. 7 uses the video delay 15 d.sub.v as output by the video alignment processor 50 and the audio delay 115 d.sub.a as output by the audio alignment processor 150 and produces the audio-visual synchronization 165 s.sub.av. Advantageously, the audio-visual synchronization s.sub.av provides a measure of the perceptual change in audio-visual synchronization from a source of audio-visual information to a destination of audio-visual information via a transmission channel. (col. 1, 32-35, see Figs. 2 and 7) Wolf et al. discloses that the audio alignment processor 150 would compute the correct audio delay 115 and the video alignment processor 50 would compute the correct video delay 15. In conditions (1) and (2) above, if both the audio delay and the video delay are measured, then the audio-visual synchronization processor 160 would compute the correct audio-visual synchronization 165. Finally, if one only desires to measure the audio-visual synchronization (and not the audio delay or video delay), then only the relative timing between the audio and video features needs to be preserved. The timing between the source features (7, 108) and the destination features (9, 110) does not have to be preserved. » (col. 14, lines 4-55) As can be seen above, the Wolf et al reference computes sync error between the audio and video, albeit separately, as does the claimed invention. The argument that characteristic features indicative of the significance of synchronization errors are

identified first, without specifying what those characteristic features according which the measurement is performed, are. Wolf's audio-visual quality parameters that are output by the apparatus are indicative of the audio visual quality of the destination audio-visual signal and are equivalent to the claimed, but undefined characteristic features indicative of the sync errors. The argument is thus unpersuasive.

b) The whole idea of Wolf et al is to modify or change the audio visual signal in order to synchronize since "advantageously, the audio-visual synchronization s.sub.av provides a measure of the perceptual change in audio-visual synchronization from a source of audio-visual information to a destination of audio-visual information via a transmission channel." Wolf teaches that Measurement parameters are human image quality perceptions and are generated by measuring the audio visual quality of a destination audio-video signal comparing to a source signal. (Abstract) The measurement parameters or the audio-visual quality parameters are indicative of the quality of the signal. Thus, the argument that "no where does Wolf et al. teach or suggest that the "audio-visual parameters" are used to modify the measure of subjective quality derived from the "audio-visual parameters" according to whether the "audio-visual parameters" are present, makes no sense, because the parameters are derived or generated for the purpose of measuring, modifying, correcting etc. the signal so that the audio/video signals are synchronized and because "audio-visual synchronization is important because a loss of synchronization due to a transmission channel affects the perceived quality of the audio-visual information." (col. 1, lines 27-30)

Wolf's system provides an improved method and system for measuring the audio delay, video delay and the change in audio-visual synchronization resulting from a transmission channel. "Advantageously, the audio-visual synchronization s.sub.av provides a measure of the perceptual change in audio-visual synchronization from a source of audio-visual information to a destination of audio-visual information via a transmission channel.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paulos M. Natnael whose telephone number is (703) 305-0019. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller can be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PMN
April 14, 2004

PAULOS M. NATNAEL
PATENT EXAMINER